DOCUMENT RESUME

ED 026 611 AC 003 757

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An Experimental Study Designed to Test the Relative Effectiveness of a Multi-Media Instructional System.

Pub Date 69

Note-8p.; Paper presented at the National Seminar on Adult Education Research (Toronto, February 9-11, 1969)

EDRS Price MF-$0.25 HC-$0.50

Descriptors-*Adult Basic Education, Adult Dropouts, *Conventional Instruction, Disadvantaged Groups, *Functional Illiteracy, Individual Study, *Multimedia Instruction, Participant Characteristics, Reading Materials, *Reading Programs, Research

Identifiers-Adult Education Act of 1966, Brooklyn, *Learning 100

A study compared the effectiveness of Learning 100 (L-100), a multimedia, multimodal, multilevel communication skills system, with that of a more conventional reading program with functional illiterates in Bedford-Stuyvesant, a ghetto area in Brooklyn, New York. In January, 1968, under the Title III Adult Education Act of 1966, Adult Basic Education Program, an experimental group (49 students) and a control group (47 students) were established; teachers were licensed and all were receiving inservice training. Student attendance records, reasons for dropout, cycle growth and placement at completion of the program, and subjective evaluation by the teachers were collected. On the basis of the Metropolitan Achievement Test, a seven month grade equivalent difference in favor of the L-100 students was found. Teachers found the program successful in that it raised aspirational levels, was self-evaluative, maintained high interest, and was flexible; instructional materials, created especially for this population, were rated good to outstanding; however, suggestions were made for more instruction in such writing skills as personal and business letter writing. Materials used in the control group provided for individual work and progress but students found them not challenging enough. (pt)

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ED026911

An Experimental Study Designed to Test the Relative Effectiveness of a Multi-Media Instructional System

To be presented at the National Seminar on Adult Education Research, February 9-11, 1969, Toronto, Canada

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Introduction

There are many adults who cannot function effectively in today's world because they lack basic literacy and communication proficiency. In different degrees, they lack the interest, self-confidence, and skills necessary to lift themselves above the level of functional illiteracy. For many such persons, the motivation to return to school has been nonexistent because school has been associated with frustration and failure.

For the students whose social-economic background has rendered them unable to cope with a traditional reading and language arts curriculum, EDUCATIONAL DEVELOPMENTAL LABORATORIES (EDL) has created a new instructional program to answer the needs and capture the interest of mature people. This program provides a new approach through which these individuals may achieve academic success.

Learning 100, also referred to as L-100, is a multimedia, multimodal, multilevel communication skills system designed for use by undereducated adults, out-of-school youths, and potential dropouts.

To compensate for the relatively limited education of most undereducated adults, heavy stress is placed on the use of audiovisual techniques such as films, filmstrips, tapes, and recordings which offer the potential for maximum instruction and enrichment in a minimum amount of time. Many of the materials and techniques are self-pacing so that each student can progress at a rate which is suitable for him.

Purpose of the Study

The present research study was conducted to compare the effectiveness of Learning 100 (L-100) in a ghetto situation with that of a more conventional reading program with subjects of similar backgrounds.

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Subjects

In January 1968, under the Title III Adult Education Act of 1966, Adult Basic Education Program, an experimental and a control group were established in Bedford-Stuyvesant, a ghetto area in Brooklyn, New York. The Title III Program was sponsored by the Bureau of Continuing Education of the Board of Education of the City of New York with federal funds obtained through the State Education Department. The experimental group, those who were to use the Learning 100 system of instruction, consisted of two classes totaling forty-nine students, twenty-three in one class; twenty-six in the other. The control group consisted of two classes with twenty-three and twenty-four students, totaling forty-seven students.

Most of the experimental group were recruited on a voluntary basis from a low-income housing project. Classes were held at the project's Community Center. The control students were in an ongoing Youth in Action (YIA) stipended work training program of which the Adult Basic Education or ABE program was a component. Control classes were held in YIA Neighborhood Centers.

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Instructional Treatments Used

The experimental classes used EDL's Learning 100 program.

The control classes used as their basic reading materials Science Research Associates (SRA) Kits and the Lippincott Reading for Meaning Series as well as supplementary reading materials. One of the control classes also used Getting the Facts, published by Barnell Loft.

L-100 classes met three evenings each week, three hours per session for a total of nine hours per week. The control group met an equivalent number of hours both in the evening and the late afternoon.

Methods and Instruments of Evaluation

In order that a comparative analysis might be made, each of the experimental and control classes was administered the Metropolitan Achievement Test, Reading Intermediate level after approximately ten hours of instruction, after approximately one hundred hours, and after approximately two hundred hours of instruction. This test was selected for use as it is the testing instrument currently being utilized by the City of New York. Experimental classes were given forms A, C and B of the Metropolitan Achievement Test, respectively; control classes were given forms C, D and A respectively. The two hundred instructional hours referred to earlier was the total amount of time spent in class work which also included mathematics and social living. Approximately two-thirds of the time or 133 hours was devoted to the language arts program which included the social living area.

Student attendance records, reasons given for student dropout, cycle growth and placement at completion of the program, and subjective evaluation of the system by teachers was collected during the experiment.

Methods of Analyzing Data

Subjective data collected by questionnaires and interviews were classified and summarized. Objective data was analyzed by an Analysis of Covariance design. Since different forms of the achievement test were administered to the groups, raw scores were converted to standard scores and these were used in the analysis.

Note that in Table 3 the mean standard score for the L-100 group was on the average initially more than three points lower than was the control group score. Therefore, it was necessary to statistically equate these groups in order that changes in scores on the posttest could be analyzed in relation to treatment effect (L-100 or control) rather than differences due to initial achievement levels.

In addition, Pearson Product Moment correlations were computed for the variables; number of cycles completed, age, and years of school completed with final achievement scores.

Description of Sample

Demographic characteristics of participants in the program were obtained at the time of enrollment.

A breakdown of participants by age, sex, and race, indicates that over ninety percent of the participants in both the experimental and control groups were both Negro and female.

More than eighty percent of the L-100 group reported that they were married. The younger control group reported almost three times as many single people.

The majority of L-100 students completed four to seven years of formal schooling whereas a similar number of control students reported that they had completed nine to twelve years of formal schooling. Approximately sixty percent of the control group and approximately seventy percent of the L-100 group attended school in the south.

All the L-100 subjects reported that they had been gainfully employed at some time as opposed to seventy-three percent of the control group. Approximately one-quarter of each group indicated that they received public assistance. Forty percent of the experimental group and seven percent of the control students chose not to respond to that question.

More than half of the Learning 100 group and all of the control subjects indicated that they were unemployed at the time of the study.

Teacher Experience and Training

The four teachers involved in the evaluation were selected by the supervisor of the ABE Program in the area. Both experimental and control teachers were asked by EDL to complete questionnaires with respect to their educational background and experience.

The two experimental and the two control teachers were Negro males who were New York City Board of Education licensed teachers holding down full-time positions during the day. All taught the ABE classes in the evenings in addition to their regular full-time assignments.

All the teachers held Bachelor's Degrees.. In general, the L-100 teachers were older and had more teaching experience with this population; one control teacher had worked with the socially maladjusted for nine years. All four were receiving concurrent in-service training in ABE.

EDL would have preferred that its system be tried by both experienced and neophyte teachers but the local administration felt it would be best if it were first tried by more experienced teachers only.

Teacher Orientation

All teachers were given the opportunity to become familiar with the programs they would teach during pre-sessions. The L-100 teachers, because of the instrumentation inherent in the program, required more total orientation than the control teachers. In addition, an EDL reading consultant was available for assistance when called upon by the teachers.

Students Leaving the Program

Twenty-four percent of the L-100 group left the program, while forty-four percent of the control group failed to complete the two hundred hours of instruction. Of the twenty-four percent of the L-100 students who withdrew from the program, more than half were transferred because they scored at the High School Equivalency level or beyond the highest level of L-100. All but three of the control students and only two L-100 students stated that they left the program for employment; several of the control students to serve as teachers' aides.

Student Attendance

An examination of the average hours of attendance for both groups shows that the control students attended more hours on the average than the L-100 students. According to one of the L-100 instructors, a factor contributing to the lower L-100 attendance was that several of the students, due to conflicting hours of part-time employment, were able to attend only two of the three weekly meetings. It is also impossible to determine from the data how much of an influence existed between the control group's record of attendance and the stipend each control student received.

TABLE 1

COMPARISON OF STUDENT ATTENDANCE

Group	Number of Students	Average Hours of Attendance		
		First 100 Hours	Second 100 Hours	Total
L-100	37	83.43	73.97	157.40
Control	26	91.38	78.69	170.07

Number of Cycles and Levels Completed by L-100 Students

Since the L-100 system is organized into cycles and levels of instruction, it is interesting to note the progress of the L-100 students in the two experimental classrooms. There are thirty cycles in each of the six levels. The readiness level contains ten cycles. Each entering student was placed according to his reading ability into an appropriate L-100 level of instruction.

Table 2 ~~of the handout~~ shows the number of students placed at each L-100 level at the start of the program and their level of attainment after approximately 133 hours of language arts instruction. At the beginning of the course seventeen students were working at the third reading level or below, but by the end of the course, only seven students were at this level; none were below. At the higher levels, twenty were working at fourth, fifth and sixth reading levels at the beginning of the course, and by the end of the course thirty were at these levels. Twenty-four of the thirty-seven students progressed through more than one level during the 133 hours of instruction.

The activities were scheduled in a free manner and students were permitted to skip cycles if the instructor judged them capable of handling the material. The average student covered 50.9 cycles or approximately one and two-thirds levels of instruction.

TABLE 2

L-100 LEVELS AT WHICH STUDENTS ENTERED PROGRAM AND L-100 LEVELS ATTAINED AFTER APPROXIMATELY 133 HOURS OF LANGUAGE ARTS INSTRUCTION

L-100 Level	Number of Students At Start of Program	Number of Students After 133 Hours of Instruction — L-100 Levels						
		R	A	B	C	D	E	F
R	2				2			
A	0							
B	5				2	1	2	
C	10				3	3	2	2
D	6						3	3
E	7						3	4
F	7							7
TOTAL	37				7	4	10	16

Analysis of Covariance

Table 3 gives the results of the Analysis of Covariance for the Metropolitan Achievement Test. The pretest (alternate forms of the Metropolitan Achievement Test) administered after ten hours of instruction was used as a covariate in order to adjust groups for initial differences in ability. The posttest, administered after approximately two hundred hours of total instruction including approximately 133 hours of language arts instruction, was used as the criterion measure.

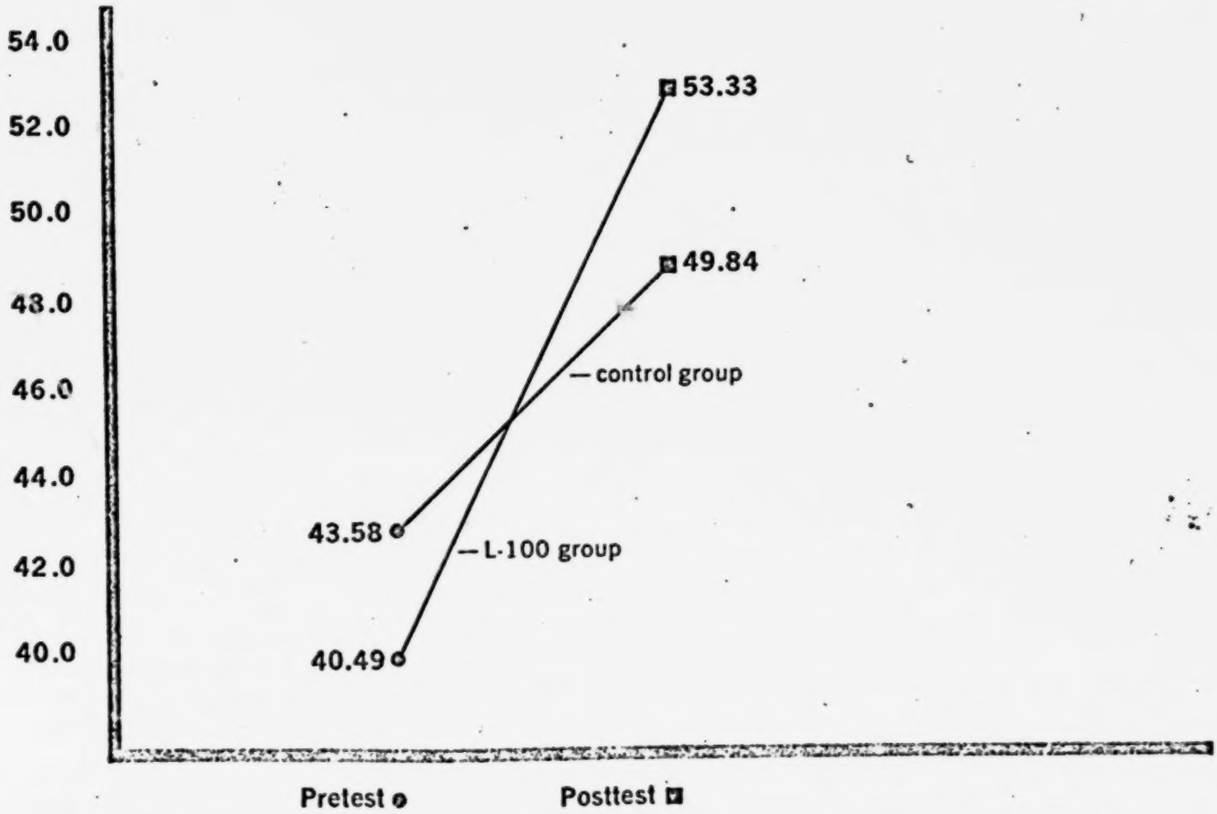
Students who were instructed with the Learning 100 system scored significantly higher than the control group on the Metropolitan Achievement Test as is indicated by the 8.52 F value. This value reflects a difference in scores that is significant at the .01 level.

TABLE 3

PRETEST STANDARD SCORE MEANS AND POSTTEST ADJUSTED AND UNADJUSTED STANDARD SCORE MEANS FOR EXPERIMENTAL AND CONTROL GROUPS

		Metropolitan Achievement Test, Reading			
		Pretest	Posttest		
Group	Number of Pupils	Standard Score Mean	Unadjusted Standard Score Mean	Adjusted Standard Score Mean	F
L-100	37	40.49	52.62	53.33	8.52*
Control	26	43.58	50.85	49.84	

* Highly significant at the 1 percent level with 1 and 60 degrees of freedom.



Graphic Representation of Pretest and Posttest Standard Score Means for Experimental and Control Groups Following Approximately 133 Hours of Instruction

Figure 1.

The pretest standard score mean for the control class was 3.1 points higher than the pretest standard score mean for the L-100 students. When converted to grade scores, this constitutes an initial five-month advantage for the control pupils. However, when these pupils were tested at the end of the instructional period, you will note that the L-100 pupils scored 3.5 points higher than the control students after adjustments were made for pretest differences. This represents a seven-month grade equivalent difference in favor of the L-100 students. Also, when comparing the pretest standard score mean of the L-100 students to their posttest mean and the control pupils pretest standard score mean to their posttest mean, you will note that the experimental students (L-100) made a proportionately greater gain than the control students; the L-100 students gained thirteen standard score points, a grade equivalent gain of nineteen months; the control students gained six standard score points, a grade equivalent gain of twelve months. The ninteen-month gain for L-100 students is in line with the actual expectation of L-100 where thirty cycles are judged to affect a one grade level change.

Correlation

Correlations computed for data were as follows:

The correlation of .25 between cycles completed and standard scores was a positive but slightly less than significant correlation. The correlation of the age variable with standard score was small and is approaching zero, indicating little correlation between age and test scores for this group. The correlation of .43 between last grade attended and standard score is highly significant and would be expected.

Subjective Evaluation

To obtain subjective data, the teachers were interviewed and responded to questionnaires.

The L-100 teachers stated that the program was successful in that it raised aspirational levels, was self-evaluative, maintained high interest for extended periods of time, was highly flexible and allowed self-pacing.

Suggestions for program improvement included a request for more instruction in specific writing skills such as personal and business letter writing.

In regard to student reaction to the instruments, one teacher indicated that of the two instruments that were to be student operated all of his students were able to operate the Controlled Reader Jr., and all but four of the class could operate the Aud-X, a synchronized filmstrip and record playing instrument. These four were reluctant to try, possibly for fear of breaking the instruments. About half of the other class never tried to operate the Aud-X.

Since the students worked in small groups with one person assigned to operate the instrument, the lack of desire on the part of some of the students to attempt to operate the instruments presented no problem.

In rating the materials, the teachers indicated that the Aud-X, Tach-X, Controlled Reader and their accompanying materials as well as the Study Skills Library, were rated as having good to outstanding instructional value. They considered the Flash-X discs to be of least instructional value. These also generated least student interest. The Controlled Reader and its accompanying materials generated outstanding student interest. The students responded very positively to the Controlled Reader stories which were created especially for this population, at their reading level and their interest level.

Both teachers stated that initially more time was required for class preparation using L-100 as compared to more traditional methods. However, once the system had been set up, much less time was consumed in preparation.

The control teachers listed as major advantages of their instructional materials that the students could work individually and progress at their own rate. However, they indicated that the reading materials were not challenging enough. Some of the materials if used daily seemed to become boring. The teachers suggested that possibly this was because of lack of group involvement and discussion.

Conclusions

To the extent that this sample is representative of the population from which it was drawn, and to the extent that the teacher questionnaires, interviews, and testing instruments were valid for this population, the following conclusions can be drawn:

1. The adult-oriented content of Learning 100 combined with instrument usage appears to maintain the interest of the undereducated adult.

2. The structure of Learning 100 allows each student to start at a point most appropriate to his instructional needs and to progress at his own rate.

3. Involvement with Learning 100 appears to increase self-confidence.

4. Involvement with Learning 100 seems to reactivate interest in learning and seems to raise the literacy levels and economic potential for the students.

5. Involvement with Learning 100 seems to cause students to become more interested in their childrens' schoolwork.

6. Although teachers of experimental classes initially experienced difficulties, once they got started they soon became comfortable and competent with the Learning 100 system of instruction and seemed pleased with the outcomes.

7. Disadvantaged adults utilizing the Learning 100 system of instruction scored at a highly significant ($p < .01$) level above the control group on the Metropolitan Achievement Test, Reading Intermediate level.

8. The level of previous schooling correlates highly (.43) with standard scores of those students utilizing Learning 100.

9. A small negative correlation (-.08) was found between age and standard scores of those students utilizing Learning 100.

In summary, under the restrictions previously stated, it appears that significant differences in achievement favoring the Learning 100 group were attained in this sample. In addition the Learning 100 system can be successfully managed by teachers who have had little previous experience with educational technology; for students, high interest and motivation are maintained and positive changes in attitude toward learning are exhibited as a result of the interest level of the reading selections and the instrumentation inherent in the instructional system.

It is difficult to generalize these results to the total population of functional illiterate adults because of the small sample size. The results are of interest, however, and provide an indication that use of the L-100 materials with a similar population could be advantageous.